

WHAT IS CLAIMED IS:

1. An electrode composition comprising:
an electrode material consisting essentially of at least one electrochemically
inactive elemental metal and at least one electrochemically active elemental metal
5 in the form of an amorphous mixture at ambient temperature that remains
amorphous when said electrode composition is incorporated into a lithium battery
and cycled through at least one full charge-discharge cycle at ambient temperature.
2. An electrode composition according to claim 1 wherein said
10 electrode material consists essentially of at least one electrochemically inactive
elemental metal and a plurality of electrochemically active elemental metals.
3. An electrode composition according to claim 1 wherein said
electrode material consists essentially of plurality of electrochemically inactive
15 elemental metals and at least one electrochemically active elemental metal.
4. An electrode composition according to claim 1 wherein said
electrochemically active elemental metal is selected from the group consisting of
aluminum, silicon, tin, antimony, lead, germanium, magnesium, zinc, cadmium,
20 bismuth, and indium.
5. An electrode composition according to claim 1 wherein said
electrochemically inactive elemental metal is selected from the group consisting of
molybdenum, niobium, tungsten, tantalum, iron, nickel, manganese, and copper.
25
6. An electrode composition according to claim 1 wherein said
electrochemically active elemental metal is aluminum.
7. An electrode composition according to claim 1 wherein said
30 electrochemically active elemental metal is silicon.

8. An electrode composition according to claim 1 wherein said electrochemically active elemental metal is tin.
9. An electrode composition according to claim 1 where said
5 electrochemically active elemental metals are aluminum and silicon.
10. An electrode composition according to claim 1 wherein said electrochemically active elemental metals are silicon and tin.
- 10 11. An electrode composition according to claim 1 wherein said electrode material consists essentially of aluminum, silicon, and manganese.
12. An electrode composition according to claim 1 wherein said electrode material consists essentially of germanium, nickel, silicon, and
15 aluminum.
13. An electrode composition according to claim 1 wherein said electrode material consists essentially of aluminum, silicon, and copper.
- 20 14. An electrode composition according to claim 1 wherein said electrode material consists essentially of silicon, tin, and copper.
15. An electrode composition according to claim 1 wherein said composition is in the form of a thin film.
25
16. An electrode composition according to claim 1 wherein said composition is in the form of a powder.
17. A lithium ion battery comprising:
30 (a) a first electrode comprising an electrode material consisting essentially of at least one electrochemically inactive elemental metal and at least

one electrochemically active elemental metal in the form of an amorphous mixture at ambient temperature;

(b) a counterelectrode; and

(c) an electrolyte separating said electrode and said counterelectrode,

5 wherein said electrode material remains amorphous after said battery has been cycled through at least one full charge-discharge cycle.